GSBN | Insights

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BLOCKCHAIN vs. AI

Navigating the Hype Cycle

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01 Executive Summary

Over the past decade, blockchain and AI have followed comparable hype and adoption trajectories characterised by periods of intense enthusiasm followed by more sobering encounters with technical, economic, and organisational reality. Yet the similarities often overshadow important differences. Blockchain emerged as a largely enterprise-led, theoretical proposition attempting to reshape finance, an already heavily regulated industry. AI, by contrast, entered public consciousness immediately as a tangible, consumer-accessible capability, accelerating both adoption and expectation.

AI's evolution has so far unfolded in distinct phases. An initial focus on conversational interfaces, followed by advances in reasoning, and now a shift toward agentic systems that can act. It is this transition from assistance to execution, that marks the point at which AI's enterprise impact becomes structurally consequential. At this stage, questions of governance, economics, trust, and integration move from peripheral considerations to central constraints.

Early blockchain initiatives focused heavily on visibility because it was the biggest pain point expressed by shippers. However, blockchain was not needed to solve visibility. Ultimately, the recognition of value only emerged once expectations reset and the technology was applied to solve more structural challenges in collaboration across the supply chain.

In the case of global trade, this emerged through a process of natural discovery. It was born from a perfect storm that accelerated the need to navigate rising volatility and complexity, whilst at the same time saw legal reforms concerning digital trade documents emerge.

Today, blockchain functions as largely invisible but essential infrastructure in global trade supporting trusted data exchange, interoperability, and enforceable coordination across fragmented ecosystems. Electronic Bills of Lading (eBLs) and interoperability frameworks illustrate how value materialised once practical problems took precedence over theoretical promise.

Blockchain's experience in global trade offers useful signals for how this phase of AI adoption may unfold.

AI now stands at a similar inflection point, albeit under very different economic conditions. Unlike blockchain, AI is accompanied by unprecedented capital investment and a pronounced "doomer" narrative driven by its perceived impact on jobs, firms, and society. Hyperscaler capex has already tripled since 2023, and forecasts now point to more than $2.7 trillion of cumulative AI-related spending from 2025 to 2029[1]. Hyperscalers are committing hundreds of billions of dollars to compute infrastructure ahead of proven business models. At the same time, there is broad consensus that AI will create significant value, even as uncertainty remains around where that value will accrue and who will capture it.

In many ways, AI today more closely resembles the internet in 1997, a point of maximum uncertainty rather than early maturity.

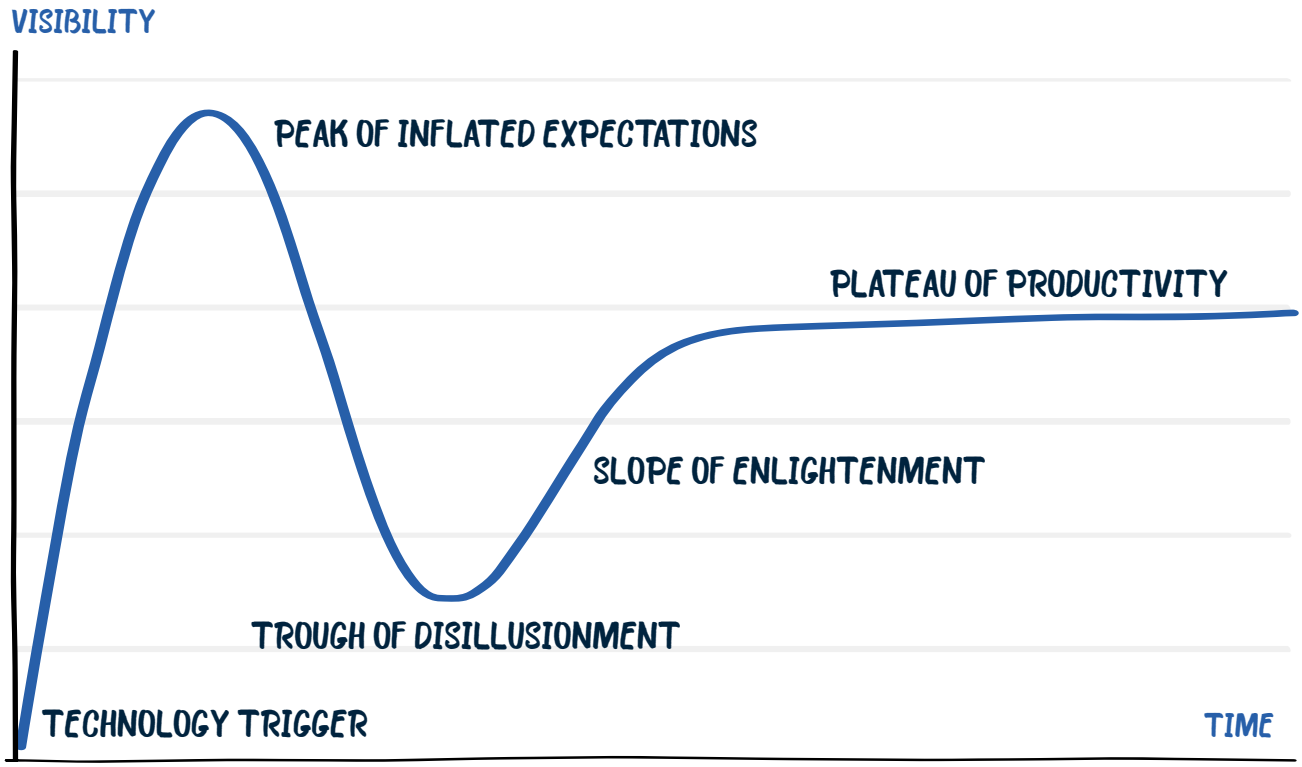
For global trade, convergence makes sense where intelligence must operate across multiple parties, where decisions carry legal and financial consequences, and where coordination increasingly occurs between humans and autonomous agents. In such environments, AI's economic value depends on trusted data, enforceable boundaries, and shared records.

Blockchain supplies these foundations. The eBL in particular, is emerging as the digital anchor at the centre of this convergence.

02 Introduction: Parallel Evolutions, Diverging Lessons

The Parallel Evolution of AI and Blockchain

Blockchain and AI were developed to solve different problems, yet their adoption curves share notable similarities.[2] [3] Both were initially positioned as general purpose, world-changing technologies.[4] Both attracted capital, talent, and attention at a pace that far exceeded their ability for near-term delivery.[5] And both were quickly reflected in the Gartner© Hype Cycle™, moving from the innovation trigger phase to the peak of inflated expectations.[2] [3] [6]



Early blockchain narratives promised radical decentralisation and value creation in the financial sector. Yet progress proved slow and more complex than many had anticipated as it was attempting to disrupt an already heavily regulated sector. Despite initial euphoria around cryptocurrencies, the lack of legal certainty and clarity became a significant barrier to institutional adoption. This was not failure by any means, but a natural and necessary transition from hype-driven experimentation to utility-first discovery where value is created by navigating standards, and alignment with legal and operational realities.

In global trade, early blockchain-led solutions prioritised visibility and transparency. Although blockchain could support these outcomes, it was not essential to achieving them. Visibility was already well served by numerous incumbent platforms, making differentiation difficult. As a result, transparency-led use cases on blockchain failed to scale and never evolved into the killer application the sector was looking for.

Today, blockchain serves as critical global trade infrastructure that facilitates trusted data exchange and

collaboration across global supply chains.[7] [8] Yet, this was not by design. It, in fact, emerged from a perfect storm of conditions. Momentum is building behind eBLs as a legally recognised digital anchor, driven by 'China+1' supply chains, geopolitical fragmentation, and rising demand for trusted cross-border data exchange. This convergence of an increasingly volatile and complex operating environment, coupled with the legal certainty for digital documents, became the tipping point.

The debate around AI is increasingly framed as a question of whether we are in a bubble. Equity markets, not least the S&P 500, are heavily underpinned by the AI growth thesis. Amid this are reports of aggressive vendor financing models evoking comparisons to the late 1990s dotcom cycle. Hyperscalers are investing trillions not because returns are assured, but because failing to invest risks strategic irrelevance. Yet, this cycle differs in one critical respect—the world remains supply constrained. Advanced chips are bottlenecked by limited manufacturing capacity, fabs take years to build, and energy and water cost constraints are emerging as binding limits on data centre expansion. The result is a market characterised by simultaneous excess capital and physical scarcity.

Comparing the Blockchain and AI Hype Cycles

Viewed through Gartner's framework, blockchain in shipping has largely exited the trough of disillusionment. Its most speculative applications have faded, while concrete, more resilient forms of adoption have taken root. Blockchain-backed eBLs and, interoperability and tokenised trade finance illustrate a shift from experimentation to enablement where blockchain functions as invisible infrastructure rather than topline disruption.

Despite intense attention, current AI adoption remains limited at scale, with few enterprises deploying agentic systems in a sustained way. According to Lenovo, only 21% of enterprises are significantly using agentic AI, while 24% have no plans to adopt it and 55% remain at the exploration or early pilot stage.[9]

This places AI close to a 1997-style moment defined by experimentation and hype than by technological maturity. For some, the value proposition is clear, but the potential impact and returns have yet to be realised. This is not because AI does not work, but because durable, sustainable use cases have yet to emerge at scale.

Blockchain's 'soft landing' demonstrated that long-term value often emerges after the hype subsides and once technologies are re-anchored to real operational problems, thus paving the way for more exciting and profound use cases to be explored. AI's current moment suggests a similar need for recalibration.

AI's Watershed Moment

Generative AI represented a genuine watershed moment for AI as a category. Its sheer accessibility marked a step change in human–machine interaction.[10] [11] For the first time, sophisticated AI capabilities became directly usable by everyday individuals, embedding themselves into everyday workflows and accelerating experimentation at an unprecedented pace.

That initial phase, however, was only the beginning. As Generative AI continues to mature, attention has shifted from interaction to reasoning, and now toward agentic systems where AI begins not just to assist or recommend, but to act on behalf of humans. This transition marks a qualitative change. AI is moving from a productivity tool to an execution layer, and in doing so, it is entering the core of enterprise operations.

As AI capabilities become more accessible, the central challenge for shipping and logistics companies is not cost or commoditisation, but the way in which AI is used. The greater risk lies in treating AI as a reactive overlay aimed at keeping pace with external hype, rather than as a capability built around native sources of advantage.

The contrast between shoe brand Allbirds' pivot into AI[12] to offset deteriorating fundamentals versus Kodak's late embrace of blockchain as a survival narrative[13] offers a cautionary analogy—that adopting fashionable technologies does not, by itself, create defensible value. In global trade, sustainability comes from embedding intelligence into trusted data, clearly defined execution rights, and operational workflows that govern real economic outcomes.

The shift toward agentic AI sharpens this challenge. Once AI systems are entrusted with initiating actions triggering payments, approving releases, reconciling records, or coordinating across counterparties, the question is no longer whether AI works, but whether it can be governed, audited, and economically justified. This is where enterprises are now being forced to confront how AI reshapes cost structures, accountability, and operating models in ways that are still poorly understood.

As Nvidia's Jensen Huang recently suggested, organisations are beginning to think in terms of a new operating reality—one where highly skilled employees are paired with substantial "token budgets", giving rise to hybrid human-agent workforces. This framing also captures a deeper shift in which AI is becoming a core economic input, not a marginal productivity enhancer. Yet, while investment is accelerating, clarity on sustainable business models is still nascent.

While many firms are already investing in AI-augmented talent, the bigger challenge is what happens next. Companies in global trade that have often evolved under traditional structures must rethink these frameworks, workflows and decision rights around AI before productivity gains can become sustainable and governable.

Yet in practice, employees are often being asked to shift from executing tasks to supervising systems, learning how to prompt, validate outputs, manage exceptions, and embed AI into day-to-day operating rhythms. The result is a widening divide between organisations that systematically build AI fluency and operating discipline, and those that rely on ad hoc adoption, amplifying productivity upside for the former while increasing uncertainty and friction for the latter, even as sustainable business models remain unclear.

> ***In hype-cycle terms, this reflects a familiar pattern: organisational restructuring and knee-jerk reactions occurring ahead of proven best practice, rather than following it.***

In parallel, Web3 infrastructure has entered a phase of sectoral growth. Legal recognition of digital documents, advances in interoperability, and the maturation of stablecoins and tokenised assets signal that blockchain is no longer searching for purpose. Instead, it is becoming a foundational infrastructure in global trade, largely invisible to consumers yet critical to coordination, provenance, and enforcement across multi-party systems.

These two trajectories are now on track to intersect. As AI moves from experimentation toward embedded decision-making and execution, its economic value increasingly depends on context, trust and the ability to act on outputs rather than merely generate them.[14] [15]

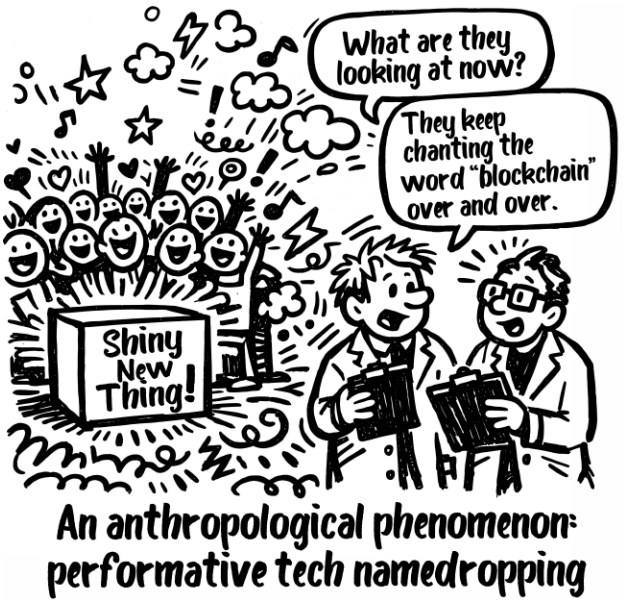
> ***Blockchain's maturation provides the trusted, verifiable data required for AI to operate across fragmented ecosystems.***

It is at this intersection that convergence becomes not only possible, but economically meaningful.

03 Barriers & Success Factors to Adoption: Expectations vs. Reality

Barriers

Perceptions of blockchain adoption have been shaped by scepticism ("a solution in search of a problem"), pilot fatigue, and high-profile failures that undermined trust in enterprise use cases (e.g. TradeLens in Supply Chain, and We.trade, Marco Polo & Contour in Trade Finance).[16 17 18 19] Consequently, blockchain projects are viewed as over-promising, under-delivering, and/or prone to technical or governance failures. Widespread blockchain adoption across industries had been hindered by persistent barriers that are broadly categorised into technical, organisational, and environmental factors, ranging from scalability bottlenecks to regulatory uncertainty.



GSBN has first-hand experiences and lessons from its journey from a many-of-its-kind tech startup to a trusted blockchain-enabled industry utility. Based on this experience, the most common blockchain adoption barriers considered either **key** or **peripheral** are outlined below.

Key Barriers to blockchain adoption in GSBN's experience

Key barriers are defined as fundamental, structural, and financial obstacles that prevent adoption from even beginning, whereas **peripheral barriers** are considered secondary issues related to implementation, usability, or user mindset that may slow adoption, but do not necessarily prevent it. Peripheral barriers commonly follow the logic of a "chicken and egg" dilemma, where organisations are hesitant to invest in unproven or complex technology, particularly in sectors with rigid traditional habits, such as supply chain and logistics.

KEY Barrier – Lack of Product-Market Fit: Many blockchain startups fail because they create products that do not solve a genuine, urgent problem, leading to over 80% failure rates in early-stage ventures.[20] These scenarios are often called "solutions in search of a problem, where many initiatives were initially designed to show the technology worked, usually through a pilot or proof-of-concept, rather than to solve a pressing, specific business problem.

KEY Barrier – Lack of Interoperability between chains hinders adoption.

KEY Barrier – Lack of Stakeholder Engagement & Trust: A primary, non–technical barrier is the lack of trust between participants and reluctance (e.g. due to imbalance of (commercial) incentives) to share data on shared platforms. This was also a key concern raised by participants in the case of TradeLens. Despite having significant financial backing, it was shut down due to challenges in achieving industry-wide participation and sustainable business models.

KEY Barrier – Unclear Governance: Lack of a central authority or unclear, rigid rules often cause conflict among stakeholders regarding data ownership, liability, and revenue sharing.

KEY Barrier – Interoperability and Integration: Difficulty integrating blockchain with legacy enterprise systems (such as ERP and transport management systems) and the lack of common data standards across blockchain networks have materially limited widespread adoption. One example of this is the case of VeChain's supply chain, which faced technical integration difficulties and as a result, a lack of widespread, sustained adoption.[21]

Peripheral Barriers to blockchain adoption in GSBN's experience

PERIPHERAL Barrier – Regulatory Uncertainty: Legal ambiguity and lack of clear compliance standards have led to high failure rates and investor hesitancy.

PERIPHERAL Barrier – Technical Scalability and User Experience (UX) Issues: Limited scalability, slow performance, high fees, security risks, lack of standardisation, difficulties in integrating blockchain with existing IT infrastructure, or complex technology that requires users to understand intricate systems (rather than just using them) posing a significant barrier for widespread adoption.

PERIPHERAL Barrier – Environmental Concerns: Despite newer, more efficient models, the perception of blockchain as a massive energy consumer persists.

PERIPHERAL Barrier – High Costs & Low ROI and/or Misaligned Incentives: Projects often fail to create shared value and the cost of participation outweigh the benefits for smaller partners. This can be due to high upfront investments in infrastructure, talent, and maintenance. When coupled with unclear, long-term ROI, this deters adoption, particularly among SMEs. This dynamic was seen with We.trade, Marco Polo, and Contour, which are blockchain-based trade finance platforms who had shut down one after another due to a combination of running out of cash, failure to secure further investment, and low market adoption. Despite backing from major banks, the platforms struggled with customer onboarding, low transaction volumes, and difficulties in scaling the business, eventually leading to insolvency.

PERIPHERAL Barrier – Organisational Resistance: Internal resistance to changing established, functional workflows, lack of skilled personnel, low management commitment, and a lack of understanding or awareness of the technology.

Those who have closely witnessed or survived the initial "Blockchain bubble" burst took lessons and pivoted to a more industry-focussed, "pragmatic" view of the technology. This is often described as "blockchain for specific use cases," rather than a universal solution offering in line with the "slope of enlightenment" phase described in the Gartner Hype Cycle.

Success Factors

GSBN's vision and adaptation of blockchain has been decidedly focused on practical use cases like the eBLs and Cargo Release, which help in overcoming initial trust and efficiency hurdles. These use cases make supply chains more transparent, cost-effective, and sustainable. During its first years as a start-up, GSBN faced many of these barriers and reputational challenges head-on because of bias alone. The company overcame these challenges because of its ability to identify the following lessons and their related success factors.

Focus on Specific Use Cases: The focus should be on small, well-defined processes rather than attempting to overhaul entire systems. When GSBN first began its operations, other supply chain innovations were mainly focused on visibility and tracking. Most were highly resource-intensive, often requiring substantial investment, training, and integration, which led to slow adoption rates. Here, we observed another common pitfall—the "collect everything from everyone" approach. This strategy was adopted by some innovators but proved to be financially unsustainable, leading to data fatigue and scepticism regarding data governance. GSBN's first product Cargo Release—a blockchain-enabled, paperless solution designed to reduce the time required for cargo to be document-ready for release from days to just hours—was first deployed in Asia and aimed to harness the region's massive, high-demand trade volumes and booming e-commerce. Crucially, it also targeted supply chain bottlenecks created by the COVID-19 pandemic, which was ongoing at the time of its launch.

Adopting Hybrid Models: Consortium and private blockchains are engineered to address the confidentiality, data privacy, and trust limitations of public blockchains by utilising permissioned networks. These models enable organisations to collaborate, share data securely, and maintain auditability without exposing sensitive information to unauthorised parties or relying on a single, untrusted third party.

Implementing Blockchain-as-a-Service (BaaS): BaaS enables faster, cost-effective, and secure adoption of blockchain technology by allowing companies to subscribe to, rather than having to build, complex infrastructure. It reduces upfront capital expenditure (CAPEX) to lower operational costs (OPEX), allowing businesses to focus on core, use case and application-specific developments.

Interoperability and Standards: These are foundational success factors for blockchain adoption, transitioning the technology from isolated pilots to a unified, trusted digital ecosystem. At GSBN, a key area of focus is to enable cross-platform eBLs to move between different networks (e.g. GSBN, IQAX, and ICE Digital Trade). Rather than developing proprietary, closed systems, GSBN advocates for implementing established standards (e.g. ISO, DCSA, BIMCO, FIATA) and recognised model laws, industry codes, and frameworks (e.g. MLETR, IGP&I) to standardise and make eBL implementation interoperable. This ensures that data formats and legal validity are universally accepted, as well as insurability.

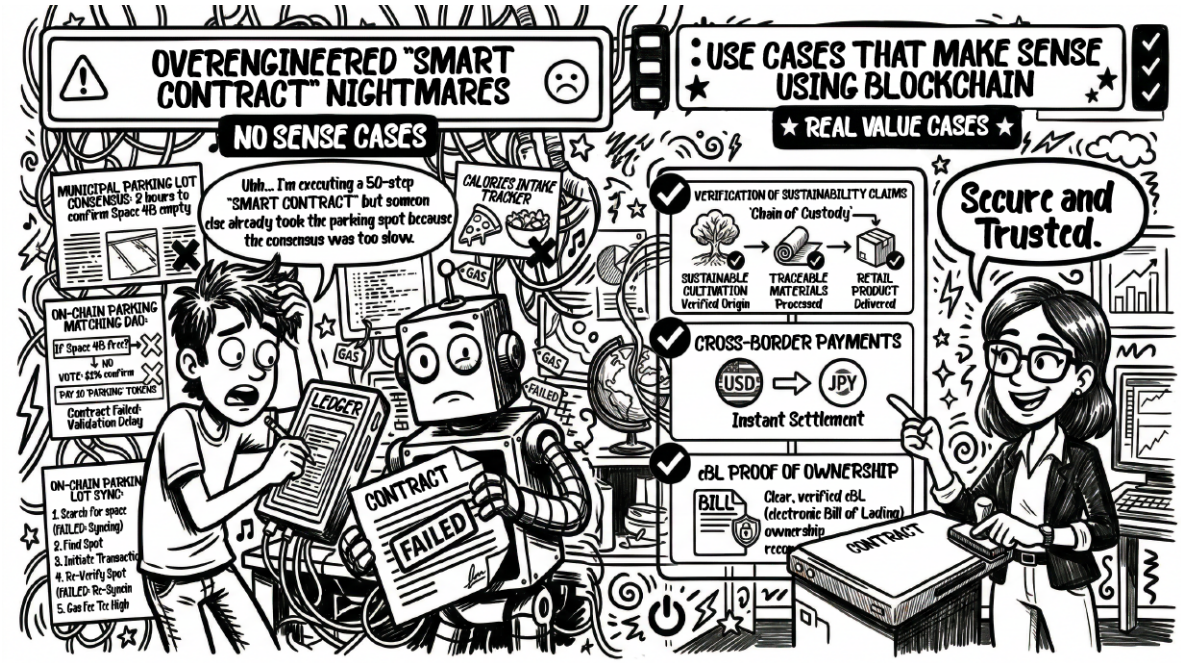
In GSBN's reflection on "Expectations vs. Reality" stage of the Blockchain Hype Cycle, the early narrative of "blockchain for everything" has shifted toward a more grounded understanding of where the technology is genuinely impactful. While broad commercial adoption has taken longer than the early ambitions and projections suggested, blockchain continues to evolve, supported by advances in scalability, interoperability, cryptographic tools, and enterprise-grade infrastructure.

Far from a passing trend, the successful adoption of use cases in supply chain, finance, and sustainability demonstrate blockchain's ongoing development as a maturing technology finding its appropriate positioning—particularly in environments where shared trust, verifiability, and multi-stakeholder coordination are essential.

04 Illustrative GSBN Use Cases

The true impact of new emerging technology is best benchmarked and understood not in theory, but through practical application across specific, high-friction industries where inefficiencies, opacity, and manual processes remain pervasive.

The following GSBN use cases highlight how blockchain can be leveraged to unlock measurable, scalable impacts.



Logistics and Supply Chain Use Cases: From Reactive to Predictive

Objective Model

Transform the information exchange among global trade stakeholders by deploying a decentralised digital infrastructure to establish a trustful supply chain network. This ecosystem replaces fragmented, paper-heavy workflows with a secure, shared ledger that facilitates the instantaneous transfer of cargo ownership and a traceable, immutable record of authorisations. By synchronising key milestones across the supply chain with all involved stakeholders, the model eliminates administrative bottlenecks and forgery risks—collapsing operational workflows from days to hours while ensuring a transparent, indelible audit trail for all participants.

Applications

eBL: Digitising the traditional paper-based Bill of Lading to enable faster, highly secure, and cost-effective way for transferring cargo title across the global supply chain.

Cargo Release: Streamlining process at destination port to ensure goods are released in a timely manner to the rightful consignee or appointed party with comprehensive audit trail.

Impact and Benefits

Operational Efficiency: Digitising document exchange facilitates near-instant turnaround times for cargo owners and significantly reduces port dwell time. This optimisation allows for higher terminal throughput and superior equipment utilisation for carriers.

Cost Savings: Eliminates the substantial administrative overhead and manual data entry errors inherent in paper systems. Furthermore, it mitigates the risk of costly penalty charges, such as Detention and Demurrage (D&D), which are typically triggered by document processing lulls.

Risk Mitigation: By providing a tamper-proof digital chain of record, the platform removes the systemic threats of lost, stolen, or forged physical documentation. Every transaction is recorded on a shared ledger, providing absolute certainty of rightful ownership.

Improve Sustainability: Drastically reduces the carbon footprint associated with global courier services and the massive consumption of specialised security paper.

Trade Finance Use Cases: Empowering Trust

Objective Model

Deploy Blockchain as the backbone of a shared digital trade infrastructure to transform trade finance by digitising, automating, and securing cross-border transactions through immutable, shared ledgers—replacing slow, paper-based systems with digital, self-executing processes that trigger instant payments once predefined conditions (e.g. delivery confirmation) are met. Shifting settlement times from days to minutes, bridging the gap between traditional and digital finance.

Applications

Digitisation of Letters of Credit (LCs): Replacing paper-based, slow, and manual workflows by enabling secure, real-time digital LCs.

Supply Chain Finance & Invoicing: Enabling real-time tracking of invoices and goods, automating supplier payments once conditions are fulfilled.

Fraud Reduction & Compliance: Providing immutable, auditable records that reduce risks like double financing and document forgery, aiding in KYC/AML compliance.

Cross-Border Settlement: Facilitates faster, cheaper, and more secure international payments and settlements without reliance on legacy correspondent banking networks.

Impact and Benefits

Increased Speed: By drastically reducing transactional processing times, such as from days to less than a few hours/minutes in some instances.

Cost Reduction: By lowering operational costs by minimising manual paperwork and intermediary fees.

Improved Transparency: By providing all authorised parties a synchronised, real-time view of trade and payment status across the value chain.

Enhanced Security: By establishing immutable records to prevent tampering, unauthorised access and changes, and fraud.

Payments Use Cases: Driving the "Digital Currency Revolution"

Objective Model

Reshaping the payments landscape with Blockchain technology by enabling 24/7, near-instantaneous, and lower-cost transactions that eliminate the need for slow and expensive intermediaries. This shift will unlock next-generation capabilities and use cases, from faster cross-border remittances using stablecoins and decentralised networks to programmable B2B payments, automated trade finance, and enhanced fraud prevention through immutable, tamper-proof records.

Applications

Cross-Border Payments: Blockchain replaces traditional correspondent banking rails with direct, near-instant international transfers that operate 24/7.

Real-Time Settlement: Eliminating intermediaries allows transactions to settle instantly, rather than over several days, improving liquidity.

Stablecoins and CBDCs: Enables the use of fiat-backed digital currencies or Central Bank Digital Currencies (CBDCs) for instant, secure transactions.

Payments Automation: Triggering automated payments when predefined contractual conditions are met, streamlining trade finance and escrow processes.

Impact and Benefits

Reduced Costs: By reducing reliance on intermediaries and manual processes, resulting in streamlined processes and significantly lower transaction fees.

Enhanced Security: With cryptographic protection and decentralised validation, eliminating single points of failure, and reducing fraud and tampering risks.

Increased Transparency: By providing a shared, immutable ledger allowing all authorised parties to trace payments flows in real-time.

Improved Efficiency: Through automation, reducing manual paperwork and administrative, error-prone tasks.

Sustainability Use Cases: Verifiable Impact

Objective Model

Utilise Blockchain technology in supporting sustainability initiatives by creating transparent, tamper-proof systems for tracking carbon credits, certified materials, and environmental compliance data. This ensures that sustainability claims are fully auditable and verifiable—supporting regulatory reporting, reducing greenwashing, strengthening ESG accountability, and increasing consumer trust.

Applications

Supply Chain Traceability: Enabling end-to-end transparency, verification of provenance and prevention of fraudulent claims.

Carbon Credit Tracking: Establish transparent, tamper-proof ledgers for carbon emissions tracking and trading, reducing double-counting and fraud.

Renewable Energy Trading: Facilitating trading of renewable energy, allowing direct exchange between organisations.

Circular Economy Facilitation: Enable tracking of materials throughout their lifecycle, monitoring waste from disposal to recycling to increase efficiency and promote circularity.

Sustainable Financing: Linking financial transactions (e.g. green bonds) to verified sustainability data, increasing investor confidence.

Impact and Benefits

Improved Transparency: Allowing stakeholders to trust in sustainability reporting and ESG metrics by precluding data tampering.

Increased Efficiency: Reducing operational costs and waste through automated ESG data collection and verification processes.

Empowered Consumerism: Enabling verification (and tracing) of product origins and environmental impact claims.

Lower Emissions & Waste: Helping to reduce the overall environmental footprint by supporting the transition to renewable energy and facilitating better resource management.

05 Reaching the Convergence Frontier: Where Intelligence Meets Trust

There's an argument to suggest the convergence of AI and blockchain is inevitable. In practice, it is conditional. These technologies do not converge because they are similar, but because each addresses a structural limitation in the other. AI functions as a capability layer extracting meaning, predicting outcomes, and automating decisions. Blockchain, by contrast, operates as an infrastructure and coordination layer, establishing shared trust, immutability, rule enforcement, and auditability across parties that do not fully trust one another.

Global trade is a natural proving ground for this convergence. A single shipment typically involves carriers, shippers, freight forwarders, terminals, banks, insurers, and regulators, each operating distinct systems with different incentives, yet all required to participate in connected supply chains. The core constraint is not computation, but coordination. This requires a single source of truth, clearly defined rights of control, and records that are legally enforceable across jurisdictions.

But a single source of truth is not enough, the data needs to be understood by all parties. This need has been recently met by ISO 5909 (developed by ISO and UN/CEFACT [22]) which standardises the processes and data structures of eBLs. This paves the way for legally recognised interoperable adoption at scale and positions eBLs as trusted anchors for automation, risk management, and decision-making.

> ***Therefore, convergence only becomes scalable when there is a digital anchor that is both legally recognised and interoperable.***

The rising adoption of blockchain-backed eBLs for shipments is increasingly fulfilling this role. Industry commitments and standards are turning adoption into a network effect. For instance, the FIT Alliance is driving the adoption of eBLs to support digitisation across international trade by 2030.[23]

As eBL volumes grow, a growth flywheel emerges. eBLs enable each shipment to be connected to more structured and authenticated trade data, better data enables more reliable AI, and more reliable AI strengthens the economic case for the exploration of more use cases. Crucially, this virtuous cycle is not driven by hype, but by tangible value creation such as fewer disputes, faster settlement, stronger compliance, and reductions in cost and friction.

Why AI + Blockchain Convergence Makes Sense

AI needs trusted, structured data and trade have historically lacked it

AI systems are only as effective as the data they consume. Yet global trade remains burdened by paper-based documentation, inconsistent formats, and manual reconciliation.[24] The growing adoption of eBLs begins to resolve this as a digital single source of truth for a shipment, linking documents and milestones across its lifecycle.[25] In this sense, the eBL functions as a 'data container', an immutable digital

representation of a physical shipment that can carry legally recognised title and transport data, while linking to financial, compliance, and commercial information.

Blockchain enables 'Data Containers' that anchor different rails

While the eBL establishes a digital anchor for each shipment, its value lies in the ability to bind together activities that would otherwise occur on separate rails. Physical movement, documentation, payments, compliance checks, and title transfers are typically handled by different systems, organisations, and timelines.

Blockchain enables the eBL to function as the common anchor across these rails. By maintaining a shared, immutable record of state changes, it ensures that events occurring in one domain such as cargo loading, payment settlement, or customs clearance, can be reliably referenced by others. This allows financial, regulatory, and commercial processes to align to the same shipment context without requiring tight system integration or bilateral reconciliation.

In this way, blockchain does not replace existing processes; it provides the common anchoring layer that allows them to interoperate around a single shipment. AI can infer and recommend, but it cannot independently guarantee that records have not been altered, duplicated, or selectively disclosed. Permissioned blockchain infrastructures address this gap by providing immutable logs, role-based access controls, and a verifiable timeline of state changes. These properties become essential as coordination increasingly occurs not just between organisations, but in a future where humans and autonomous agents are coordinating with each other throughout the journey of a shipment.

Human-agent coordination require enforceable handshakes

Anchoring data as well as the associated rails against each shipment is only the first step. Global trade is driven by workflows, such as the sequences of decisions, approvals, and transfers involving carriers, shippers, consignees, agents, banks, insurers, ports, and regulators. Moving a container from Shenzhen to Los Angeles can involve twenty or more parties, each acting at different points in time, often in response to disruptions.

As AI systems become more agentic, they will increasingly operate within these workflows to initiate actions, respond to exceptions, and coordinate on behalf of humans. This makes it essential that each interaction is anchored to the correct shipment context and reflects a confirmed agreement.

Blockchain enables these digital handshakes by tying commitments, rights transfers, and role changes back to the eBL anchor. Whether the interaction occurs between organisations, between agents, or between humans and agents, the handshake is verifiable against the same shipment record. In hybrid human-agent environments, this trusted anchoring is what ensures coordination remains defensible as agent-driven automation increases.

How Convergence Could Apply to Global Shipping and Logistics

The convergence frontier becomes tangible when mapped to priority value pools in global trade. Two prominent areas are that of customs and trade finance.

Customs: From compliance obligation to financial risk engine

Customs processes are becoming more data-intensive, more automated, and more consequential. What was once primarily a compliance function is now a source of direct financial risk. Duties, tariffs, penalties, and release decisions increasingly depend on the quality, consistency, and timeliness of data. AI can map, score, and assess trade data in real time by classifying goods, detecting anomalies,

and forecasting exposure. However, these capabilities are only defensible if the underlying data is trusted. The eBL, as a data container, provides the anchor. Blockchain preserves provenance. AI orchestrates interpretation and action. Together, they enable customs processes to shift from reactive checking to proactive risk management.

Trade Finance: agent-driven liquidity and settlement

Our previous report framed the "Internet of Trade", highlighting that global commerce runs on two interconnected rails—the physical movement of goods and the financial movement of money. We believe eBL adoption will reach critical mass when it reconnects these rails. Serving its role as a data container, the eBL allows payment and financing to be conditioned on shipment milestones and transfer status, reducing disputes and accelerating reconciliation. The rise of stablecoins and tokenised deposits is significant for agent-to-agent atomic settlement in trade.[26]

As AI agents begin to manage financing, reconcile milestones, and trigger payments, trusted records become essential. eBLs allow financing and settlement to be conditioned on shipment events. Blockchain ensures shared agreement on what has occurred. AI enables dynamic risk assessment, pricing, and execution. The result is not frictionless trade, but faster, more coordinated liquidity flows.

06 Conclusion: From Hype to Sustainable Value Creation

The development paths of blockchain and artificial intelligence point to a consistent lesson. Hype is a poor predictor of long-term impact. Technologies that endure are those that survive disappointment, recalibrate expectations, and re-emerge as infrastructure embedded in real operational workflows. In global trade, blockchain's journey to practical utility illustrates this clearly.

> ***Progress did not come through dramatic disruption, but through solving unglamorous problems: paper-based documentation flows, fragmented data, friction in coordination, and slow settlement across supply chains.***

As expectations reset, durable value emerged. eBLs, interoperability frameworks, and tokenised trade finance show how blockchain became less visible over time, yet more consequential.

AI now stands at a comparable moment, though it is often mischaracterised as being further along than it is. Despite the intensity of attention fuelled by feats in Generative AI, deep vertical adoption at scale in global trade remains limited, with many applications still experimental rather than embedded in core operations. This places AI closer to early value discovery than to maturity. Historically, however, this is precisely the stage at which consequential players begin to move, not because outcomes are certain, but because advantage accrues to those who learn early where value can be created and defended.

For organisations seeking to adopt and monetise AI, the more immediate risk lies in adopting the wrong stack. Attention is often directed toward tools and applications, when the more consequential issues sit upstream, whether it's in data readiness, security, and trust. Without trusted data, automation amplifies noise, and agentic systems scale uncertainty rather than value. AI faces the same structural constraint. Capability alone does not create readiness, and value emerges only when intelligence is embedded in data that can support real, accountable economic decisions.

The potential convergence of AI and blockchain will not be a prerequisite for AI maturity, but a consequence of it. In an environment defined by volatility, fragmentation, and regulatory complexity. Convergence becomes rational when intelligence must operate across multiple parties, when coordination increasingly involves both humans and autonomous agents, and when decisions carry legal and financial consequences. In global trade, the eBLs increasingly fulfils this role by anchoring ownership, rights, and obligations in a digitally interoperable and legally recognised form. As eBL adoption scales, trade data associated with each shipment becomes more structured and reliable. That data enables more dependable AI, which in turn strengthens the case for deeper integration and automation. The result is a virtuous cycle grounded not in hype, but in execution.

The next phase of value creation in global trade will not be defined by AI or blockchain in isolation. It will be shaped by how intelligence and trust are recomposed into shared systems that support coordination across fragmented ecosystems. At that point, AI becomes a practical value creator, and blockchain fades into the background as enabling infrastructure.

> ***If there's one lesson here, it is that hype is finite but long-term value is cumulative. The next phase of global trade will be built together on trusted data, interoperable systems, and enforceable workflows enhanced by intelligent automation. GSBN invites industry participants to collaborate on shared infrastructure that scales real economic value.***

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08 About GSBN

The Global Shipping Business Network (GSBN) is a neutral, not-for-profit consortium whose mission is to enable paperless, accessible and sustainable growth in global trade with its data infrastructure and ecosystem of partners. GSBN facilitates trusted collaboration between participants across the shipping industry to enable greater efficiencies, and paperless trade as well as supporting the shipping industry's decarbonisation transition.

GSBN's ecosystem includes shipping lines, terminals, banks, application developers and other consortia. The entire network accounts for more than half of the containers handled in the world.

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